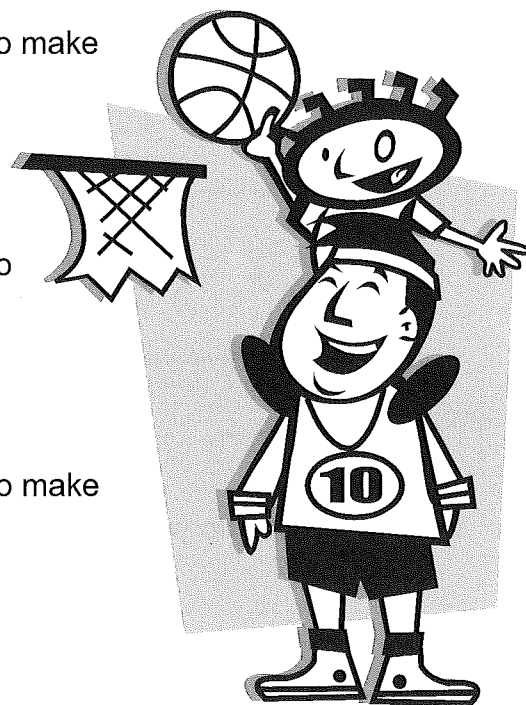




Height Puzzles

The cards represent the heights in inches of 6 players on the basketball team. Use the cards to help you answer the following questions.

- 1 Choose 4 heights that have a mode of 70 inches. Justify your answer.
- 2 Choose 4 heights that have a range of 5 inches. Justify your answer.
- 3 Choose 4 heights that have a median of 67.5 inches. Justify your answer.
- 4 What height could be added to the original set of data so that there is only 1 mode? Justify your answer.
- 5 What height could be added to the original set of data to make the median 70 inches? Justify your answer.
- 6 What height could be added to the original set of data to make the range 10 inches? Justify your answer.
- 7 What height could be added to the original set of data to make the mean 70 inches? Justify your answer.





Unit 10 Lesson 3

Training Workout

Data was collected from 20 students who are trying out for the basketball team. Find the mean, median, and mode for each set of data and answer the questions.

Part 1

Hours Spent Exercising in One Week

0, 0, 0, 0, 0, 1, 1, 2, 2, 2.5, 3, 3, 3, 4, 4.5, 5, 6, 6, 6, 10

Mean = _____ Median = _____ Mode = _____

- 1 If the coach wants to report the most common number of hours spent exercising, which measure should he report? Why?
- 2 Which measure describes the data the least favorably?
- 3 Which measure do you think describes the data most accurately? Why?
- 4 If a bar graph were created of the data, which bar would be the highest? Which measure does this correspond to?

Part 2

Miles Jogged Each Week

0, 0, 0, 2, 2, 3, 3, 3, 4, 4, 4, 4, 4, 6, 6, 6, 7, 7, 7, 8

Mean = _____ Median = _____ Mode = _____

- 5 Which measure do you think describes the data most accurately? Why?
- 6 If each data point is doubled, how will that affect the mean, median, and mode?



Training Workout

Part 3

Number of Sit-ups Each Day

0, 0, 10, 10, 20, 20, 20, 20, 20, 25, 25, 25, 25, 30, 30, 30, 35, 50, 100, 150

Mean = _____

Median = _____

Mode = _____

- 7 If the students want the number of daily sit-ups to appear high, which measure should they use? Why?
- 8 If the students want to report the measure of data that is not influenced by extreme values, which measure should they report? Why?
- 9 What is it about the data that causes the measures to differ?
- 10 What is the range for this data set?

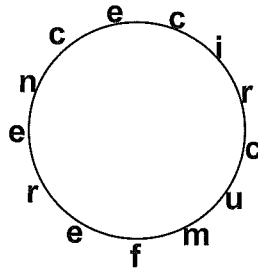




Unit 10 Lesson 3

Picture This

A graphic representation of a term is a picture model that defines the term. The example below illustrates that circumference is the distance around a circle.



Create a graphic representation for each of the following terms.

Mean	Median
Mode	Range



Independent Practice

The mean, median, mode, and range are statistical measures that are often used to describe data. The mean, median, and mode are also called measures of central tendency.

The **mean** refers to the average value of a set of numbers. The mean is influenced by all of the numbers in the data set. When one of the values is significantly larger or smaller than the rest of the values, that value can move the mean away from the main group of values.

The **median** is often used when one of the values is significantly larger or smaller than the rest of the values.

The **mode** is the value that occurs more often than any other value. There may be no mode, one mode, or more than one mode for a set of data. The mode is often used for categorical data, such as favorite ice cream flavor.

The **range** of the data is the difference between the largest and smallest values in the data set.

Example:

The table below shows the number of hours spent watching television each day by 11 students. Find the mean, median, mode, and range of the data. Then determine which measure of central tendency would best describe the data.

Daily Television Watching

Hours	Number of Students
0	1
1	5
2	3
3	1
4	1

The data can be written as a list: {0, 1, 1, 1, 1, 1, 2, 2, 2, 3, 4}.

Mean	The sum of the data is 18. Since 11 students were surveyed, the mean is approximately 1.6 hours.
Median	The median is the value in the middle of the list of data once it is arranged from least to greatest. The median is 1 hour.
Mode	The mode is the value that occurs the most. The mode is 1 hour.
Range	The range is the difference between the largest and smallest values in the data set. The range is $4 - 0 = 4$ hours.

The median or mode would best describe this data.



Unit 10 Lesson 3

1 A CD has 5 songs that last for a total of 28 minutes.

a) What is the average song length?

b) If an additional song were added to the CD that has a length of $3\frac{1}{2}$ minutes, what effect will that have on the mean? Justify your answer.

2 At a shopping center, the security patrol recorded the following speeds of customers as they drove through the parking lot.

15, 10, 5, 10, 3, 3, 3, 5, 5, 5, 15, 25, 5, 25

If the security patrol wants to convince the owner of the shopping center that customers are driving too fast through the parking lot, which measure of central tendency should he use? Justify your answer.

3 A bowler has scores of 155, 170, 170, 120, and 138. Which measure of central tendency will make his scores appear the most favorable? Justify your answer.



- 4 Jonathan wants to convince his parents to increase his weekly allowance of \$10. He surveyed his friends to find out how much each of them received for an allowance. The results are in the table.

Weekly Allowance

Allowance	Number of Responses
\$0	3
\$5	2
\$10	3
\$15	3
\$20	4

Which measure of central tendency should Jonathan use to convince his parents that his allowance should be increased? Justify your answer.

- 5 Customers at an amusement park were surveyed about the amount of money they spent on snacks while at the park. The results are listed below.

\$2, \$3, \$4, \$5, \$5, \$7, \$7, \$7, \$10, \$15

If the amusement park owner wants to convince customers that snack prices are affordable, which measure of central tendency should he use? Justify your answer.



Unit 10 Lesson 3

- 6 A game show contestant scored the points listed in the table for the first 4 rounds of a game.

Game Show

Round	Points
1	150
2	150
3	180
4	140

If the contestant scored 100 points during Round 5, which measure of central tendency would change the most? Justify your answer.

- 7 A club sponsor surveyed his members to find out their favorite flavors of ice cream. The results are listed in the table.

Favorite Ice Cream Flavor

Flavor	Responses
Vanilla	10
Chocolate	5
Mint Chocolate Chip	7
Butter Pecan	3

Which measure of data should the club sponsor use to determine the flavor of ice cream that would appeal to the most club members?



Data, Anyone?

Ten numbers in a data set have a mean of 25 and a median of 20. If each number in the data set increases by 10, what effect will that have on the range? Justify your answer.

FOR TEACHER USE ONLY:

a. YES NO Student arrives at a correct solution?

	4	3	2	1
b. Conceptual Knowledge				
c. Procedural Knowledge				
d. Communication				



Unit 10 Lesson 3

- 1 A teacher surveyed 20 students to find out how much time they spent exercising each day. The results are displayed in the table below.

Exercise	
Hours	Number of Students
0	5
1	5
2	1
3	5
4	4

Which measure of data should the teacher use to show that students typically spend $1\frac{1}{2}$ hours or less exercising each day?

- A Mean
- B Median
- C Mode
- D Range
- 2 For a set of data with 10 values, the mean is 65. Which of the following must be true?
- A The median is 65.
- B The range is less than 65.
- C The mode cannot be 65.
- D The sum of the data is 650.

- 3 The temperature was recorded each Monday at 8 A.M. for 6 consecutive weeks as shown below.

70°F, 72°F, 75°F, 80°F, 85°F, 85°F

Which measure of data corresponds to 77.5°F?

- A Mean
- B Median
- C Mode
- D Range
- 4 The salaries of 14 employees are listed in the table below.

Annual Salary	
Salary	Number of Employees
\$20,000	6
\$25,000	5
\$30,000	2
\$100,000	1

Which measure of data would make the salaries the least attractive?

- A Mean
- B Median
- C Mode
- D Range